

## Short Communication

# Occurrence of *Lernaea cyprinacea* (Crustacea: Copepoda) in an endemic cyprinid fish, *Chondrostoma orientale* Bianco & Banareescu, 1982 from the Kor River Basin, southwestern Iran

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**Abstract:** Occurrence of *Lernaea* parasite in a narrow distributed endemic fish, *Chondrostoma orientale* (Oriental nase) restricted to the Kor river basin, Southwestern Iran is reported. Based on the obtained results, all three collected specimens (TL= 174-192mm, SL= 148-169mm) were infested with *Lernaea* parasites which were attached to the base of dorsal, pectoral, caudal and pelvic fins and also body muscles. The prevalence and intensity of parasite was 100% and 10.3, respectively. Due to effects of *Lernaea*, a long term monitoring of the parasites and fishes in the Kor River basin is highly recommended.

**Keywords:** Parasite, Infection, Monitoring, Lernaeosis disease, *Chondrostoma orientale*.

## Introduction

*Chondrostoma cyri orientalis* Bianco and Banareescu, 1982 (Cyprinidae) was originally described from the "Pulwar River near Persepolis, Kor River Basin, Fars Province, Iran. It is now valid as *Chondrostoma orientale* Bianco and Banareescu, 1982 (Oriental or Kor nase) distributed only in Kor river basin of Iran (Elvira 1997; Esmaeili et al. 2010; Coad 2014; Eschmeyer 2014). It is a rare and vulnerable species as comprehensive effort to collect it was not successful; during the past 10 years only three specimens were collected from Kor river basin in 2005. All three collected specimens were infested with *Lernaea cyprinacea* ecto-parasites.

*Lernaea* Linnaeus, 1746 (Cyclopoida: Lernaeidae) or anchor worms are parasitic copepod found on the skin and gills of freshwater fishes and cause Lernaeosis disease (Marina et al. 2008). It has been widely translocated with cultured fish species

and is now found throughout North America, Europe, Asia, southern Africa and eastern Australia (Hoffman 1970; Lester & Haywood 2006). *Lernaea* spp. have a very wide host range and have been found on more than 45 species of cyprinids (Cypriniformes), as well as fishes belonging to many other orders and occasionally on tadpoles of amphibians (Tidd & Shields 1963; Lester & Haywood 2006; Piasecki et al. 2004; Kupferberg et al. 2009). Although *Lernaea* is not native to Iran but it was accidentally introduced to Iran with exotic fishes (see Barzegar & Jalali 2009) and currently it can be found throughout the country, both in native and non-native fishes in different water bodies in Zarivar Lake (Jalali et al. 2006), Choghakhor Lagoon (Raissy et al. 2008), Gandoman Lagoon (Raissy et al. 2010), and Gheshlagh (Vahdat) Reservoir, Kurdistan Province (Bozorgnia et al. 2012), Kor River basin (Rahimi et al. 2013) and Mashkid River basin (Malekzahi et al. 2014) in Iran.



**Fig.1.** *Chondrostoma orientale* from Kor river basin (ZM\_CBSU5793).

In this paper, we report the occurrence of *Lernaea* parasite in a narrow distributed endemic fish, *Chondrostoma orientale* restricted to the Kor River basin, southwestern Iran.

### Materials & methods

During the ichthyofaunal study of Kor River basin in 2005, three specimens of *Chondrostoma orientale* (Fig. 1) were collected by electrofishing from the main stream of Kor River. The collected specimens were preserved in 10% formalin and deposited in the Zoological Museum, Collection of the Biology Department of Shiraz University (ZM-CBSU5792, 3). Total length (TL) and standard length (SL) of the specimens were measured. External surface of all individuals were investigated macro- and microscopically for detecting lernaeid parasites. The worm-like objects of lernaeid parasites were examined under light microscope for diagnosis of the infection. *Lernaea* parasites were carefully detached from the infected parts of different fish body parts. Prevalence (%) was calculated according to the percent of infected fish divided by the total number of fish. The intensity was determined by dividing the total number of collected parasites to the number of infected fish samples, while abundance was calculated by dividing the total number of collected parasites to the total number of examined fish (Gholami et al. 2011; Mehraban et al. 2014).

### Results and Discussion

All the three collected *C. orientale* specimens (TL= 174-192mm, SL= 148-169mm) were infested with 31 *Lernaea cyprinacea* parasites which were attached to the base of dorsal, pectoral, caudal and pelvic fins and also body muscles (Fig. 2). The prevalence,



**Fig.2.** *Chondrostoma orientale* infested by *Lernaea* parasites from Kor River basin (ZM\_CBSU5792).

intensity and abundance of parasite were 100, 10.3 and 10.3, respectively.

*Lernaea* spp. (commonly *Lernaea cyprinacea*) has been widely distributed throughout the world, presumably through the translocation of cyprinid hosts such as goldfish, *Carassius auratus* and common carp, *Cyprinus carpio* (Piasecki et al. 2004; Marina et al. 2008). The *Lernaea* parasite was reported for the first time in *Gambusia* sp. (probably *Gambusia holbrooki*) in 1981 and in common carp and Chinese carps in 1981 and 1982 (Jalali 1997) from northern Iran and now it has been widely distributed throughout Iran presumably through the translocation of exotic cyprinid hosts and has infested many native freshwater fishes of Iran (Barzegar & Jalali 2009). Both these exotic carps have been reported from Kor river basin which could act as alien host parasites in this basin. There are many alien fish species distributed in different basins of Iran that often carry alien parasites. It seems that the wide distribution range of alien species may have a significant role in the spread of these parasites (Esmaili et al. 2014).

*Lernaea* infestations can have serious pathogenic effects on their fish hosts. Copepodites may cause disruption and necrosis of gill epithelium, while attachment of adult females usually causes hemorrhages, muscle necrosis and an intense inflammatory response, sometimes associated with secondary bacterial infections (Khalifa & Post 1976; Berry et al. 1991). The infected fishes are not eliminated directly by the parasite, however, it may open routes for secondary infection and finally,

related growth retardation, behavioral changes and associated secondary invaders may lead to death of the infected individuals (Robinson & Avenat-Oldewage 1996) and finally reduce the fish (e.g., *Chondrostoma orientale*) populations. This will be very important from conservation point of view for this rare and endemic fish.

As there are some reports of parasites from some other native fishes of Kor River basin i.e. *Lernaea* from *Aphanius sophiae* (Rahimi et al. 2013) and *Contracaecum* sp. and *Capillaria* sp. (Nematoda) from *Capoeta damascina* (Gholami et al. 2014), a long-term monitoring of the parasites and fishes in this basin is highly recommended.

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